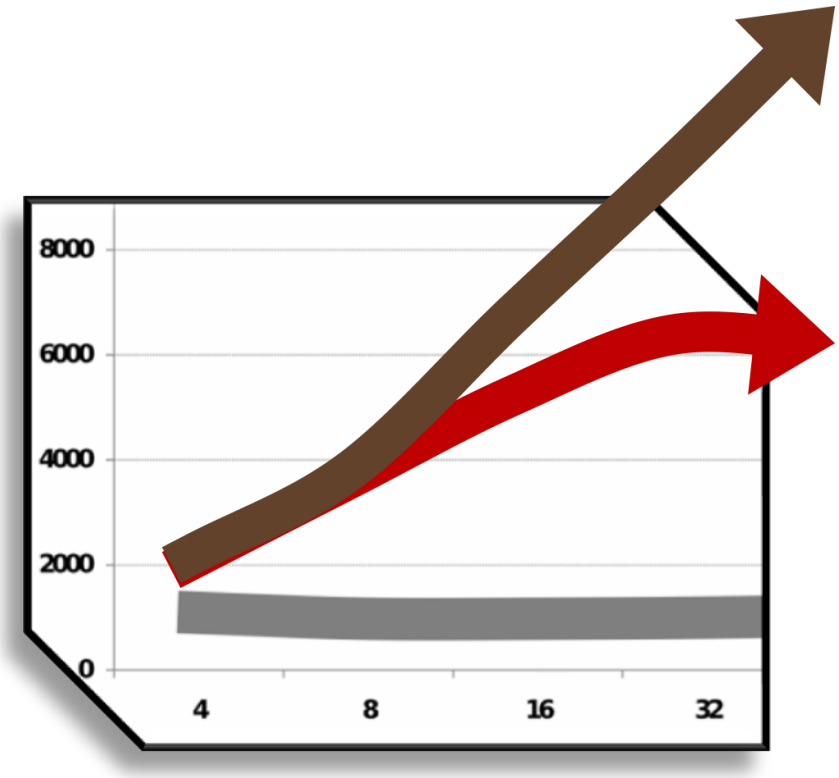
BROWN
Database Group

On Predictive Modeling for Distributed Databases

@andy_pavlo

VLDB - August 28th, 2012



Databases?

Evan Jones?


Putin is going to get re-elected!
Romney has a Swiss bank account!
Muammar Gaddafi is in trouble!

High-Volume Transaction Processing



H-Store

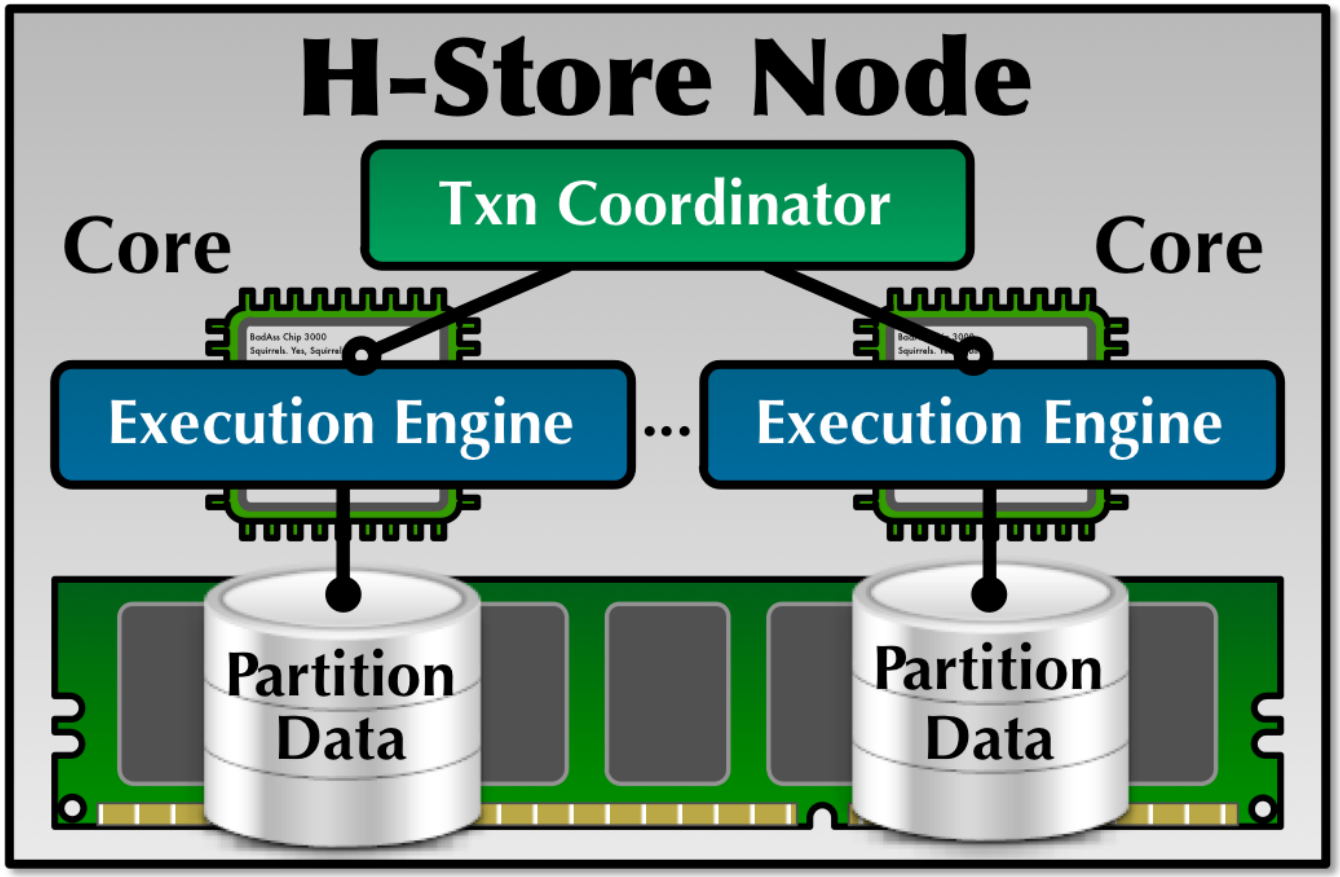
Main Memory • Parallel • Shared-Nothing

H-Store: A High-Performance, Distributed Main Memory Transaction Processing System

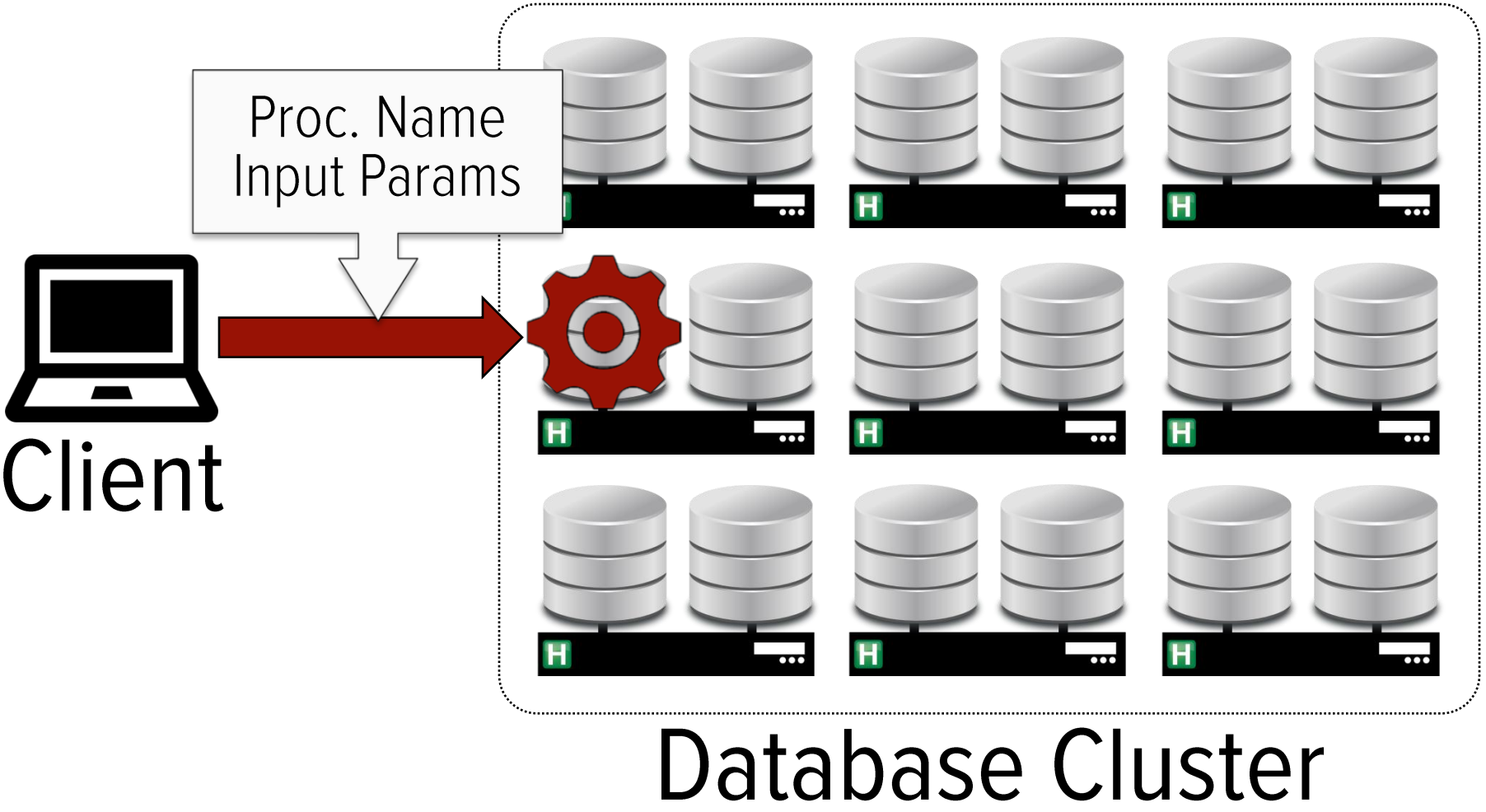
Proc. VLDB Endow., vol. 1, iss. 2, pp. 1496-1499, 2008.

Fast Repetitive Small

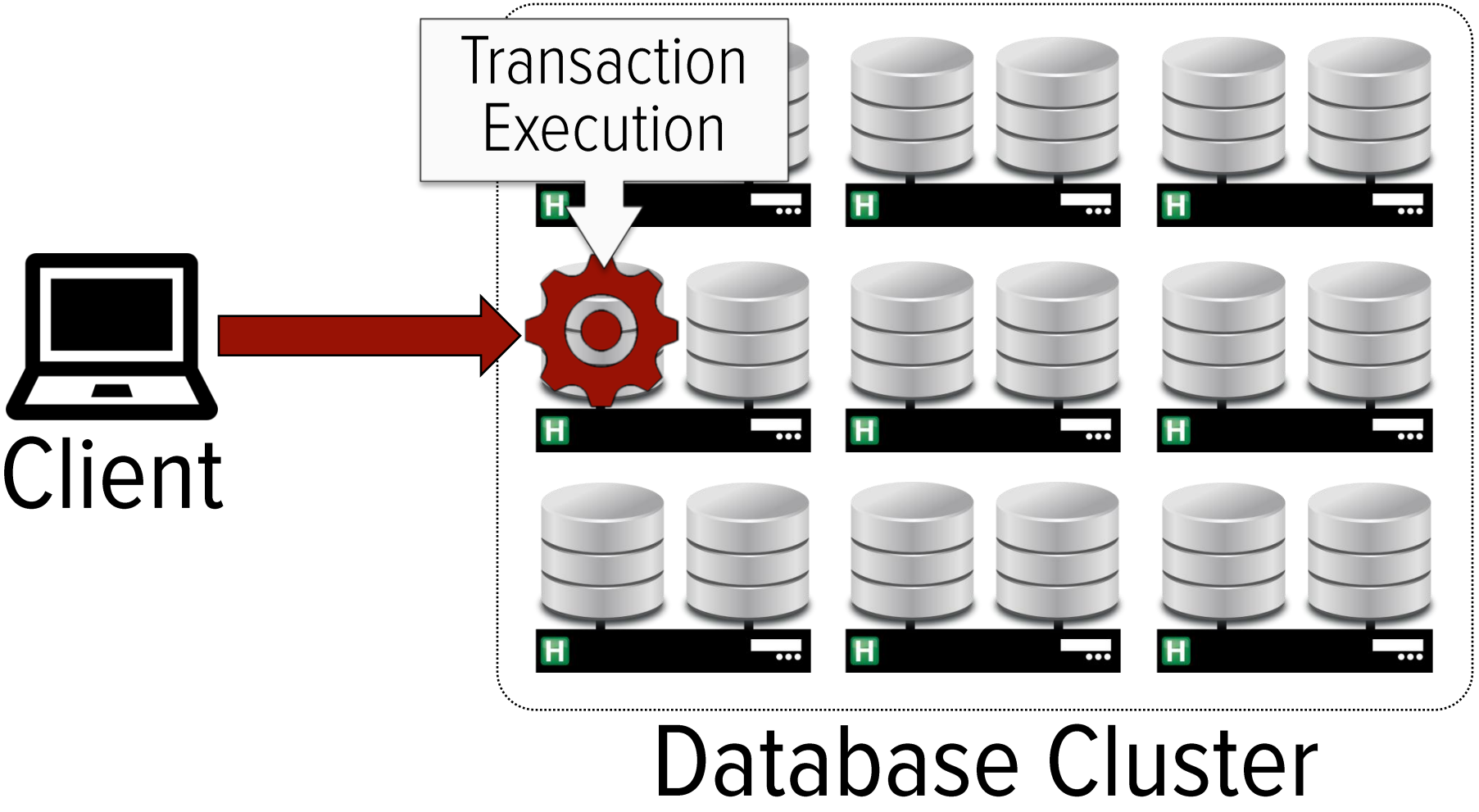
H-Store


H-Store Node
Txn Coordinator
Core
Core
Execution Engine
Execution Engine
Partition Data
Partition Data

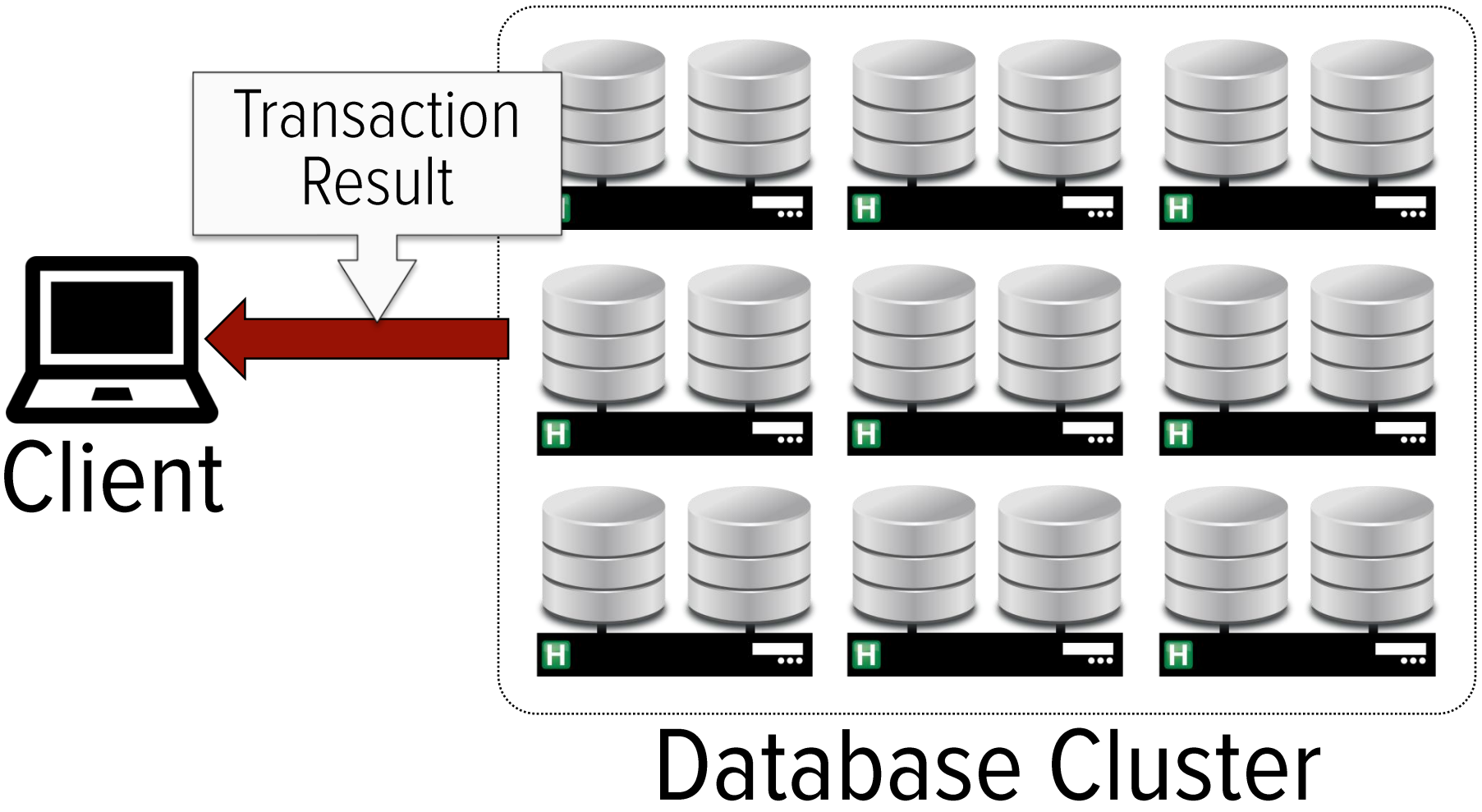
H-Store



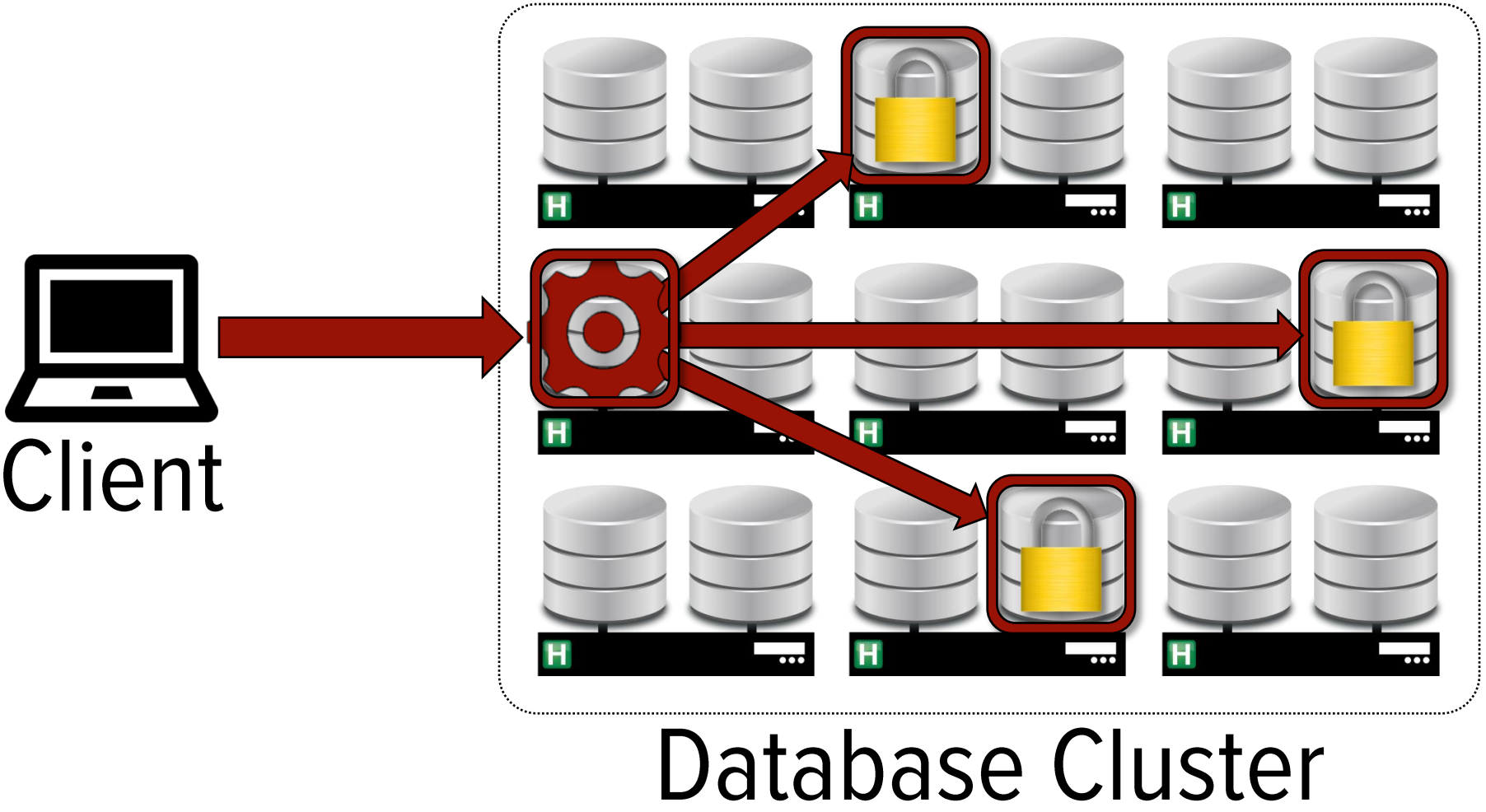
H-Store



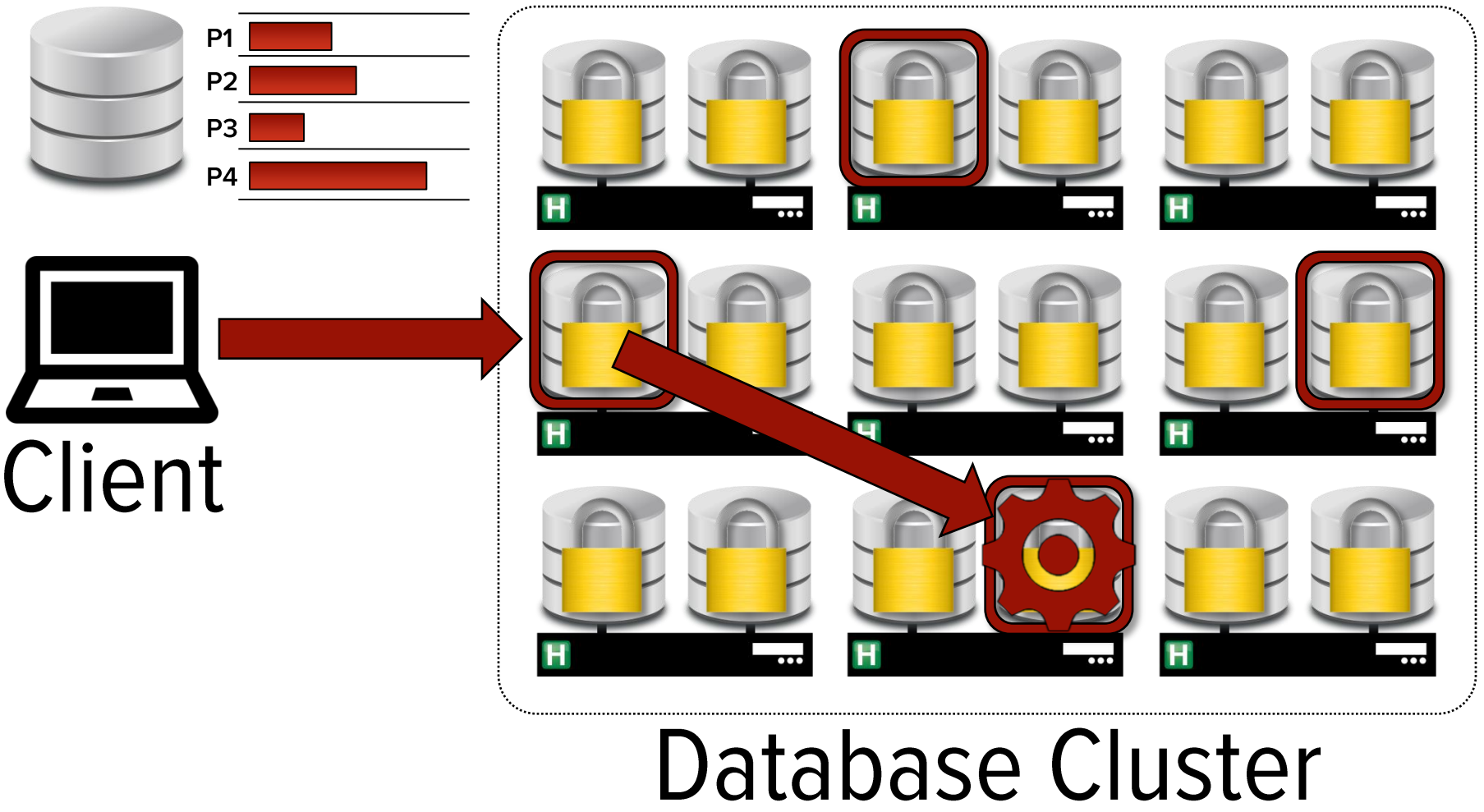
H-Store



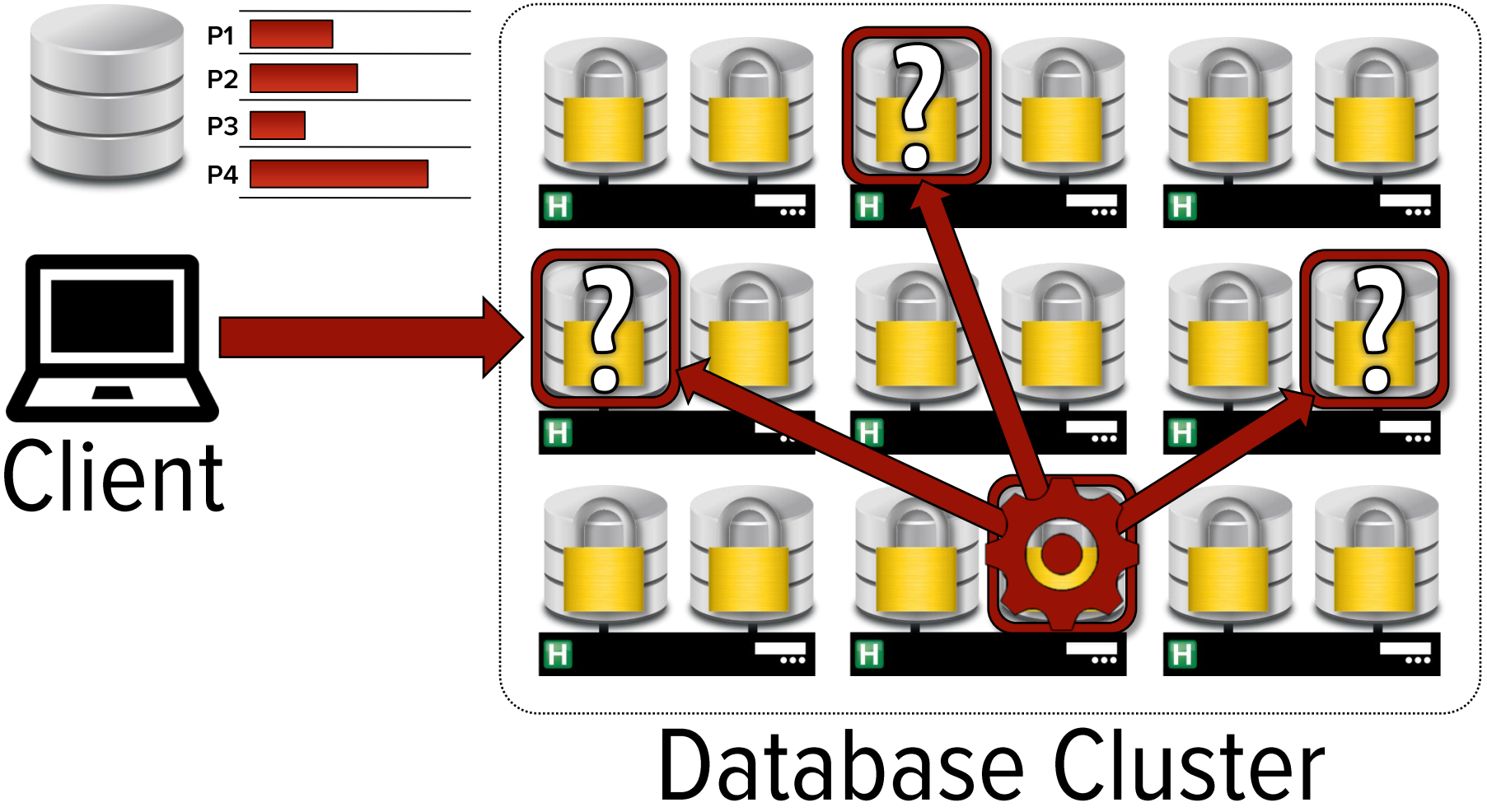
H-Store



H-Store



H-Store




This transaction will execute 4 queries on partitions 1,3, and 6!

Pro Tip:

Canadians do not like unnecessary surgeries.

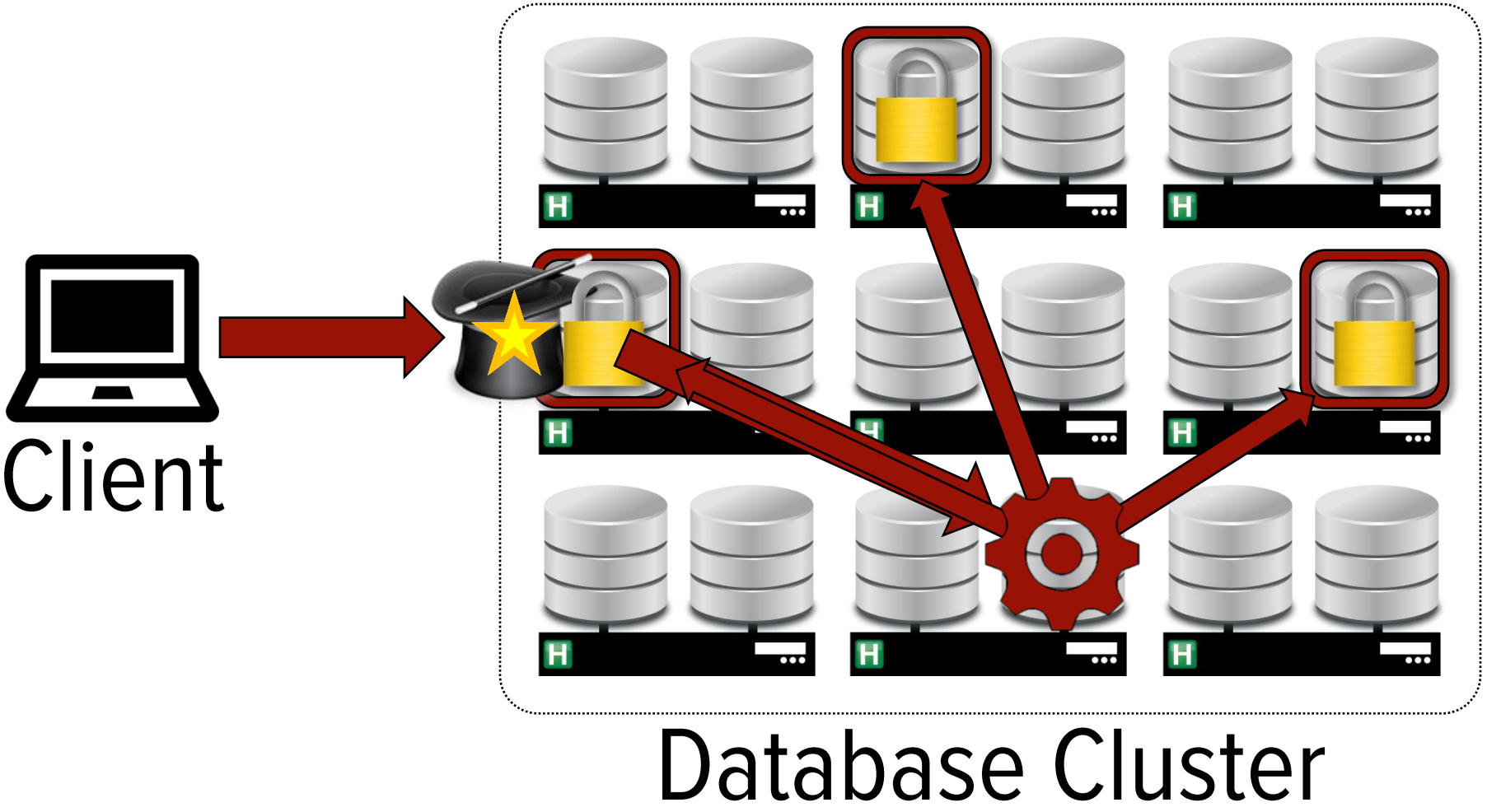
Main Idea:

Use models to predict transaction behavior before execution.

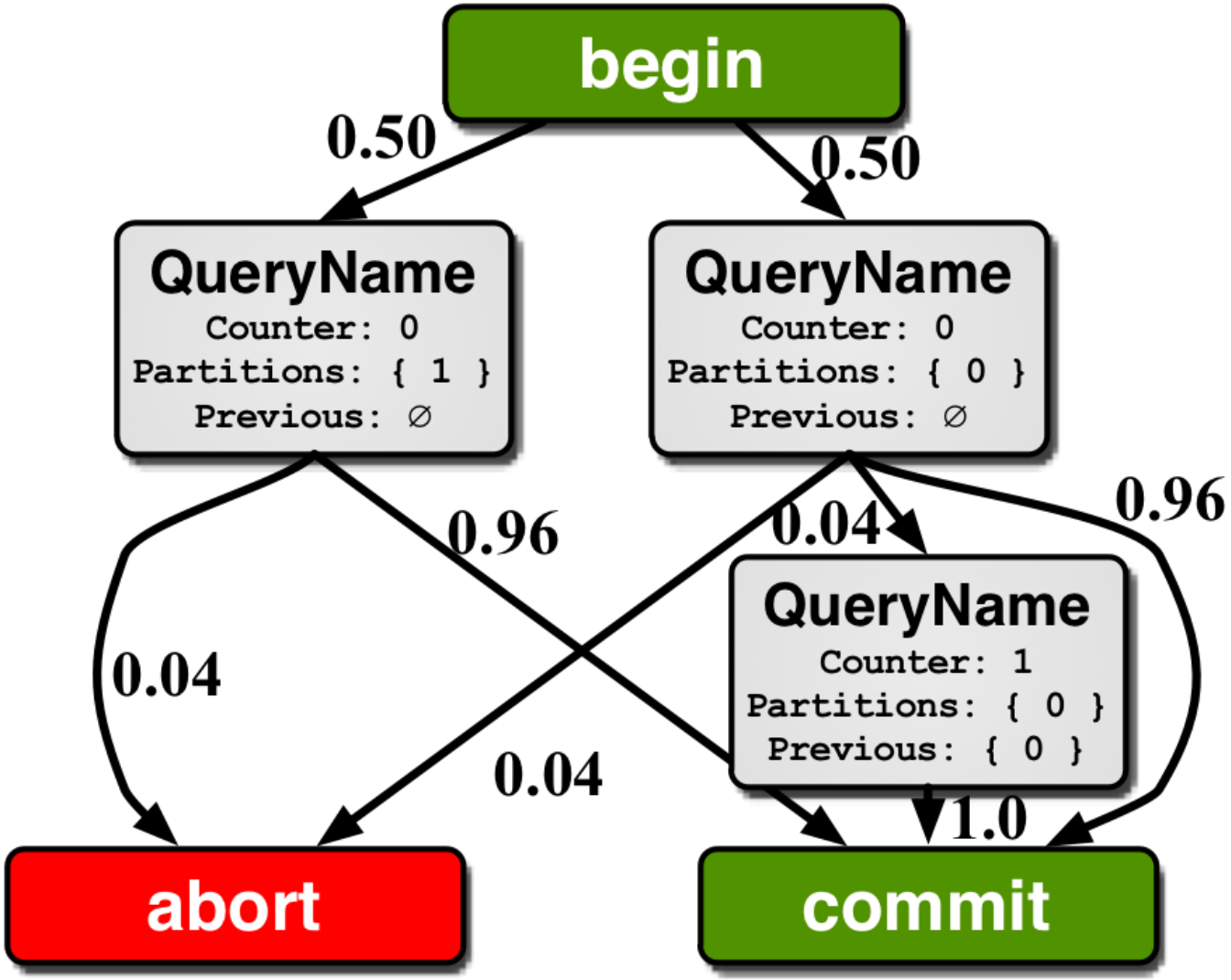
On Predictive Modeling for Optimizing Transaction Execution in Parallel OLTP Systems

Proc. VLDB Endow., vol. 5, iss. 2, pp. 85-96, 2011.

Houdini



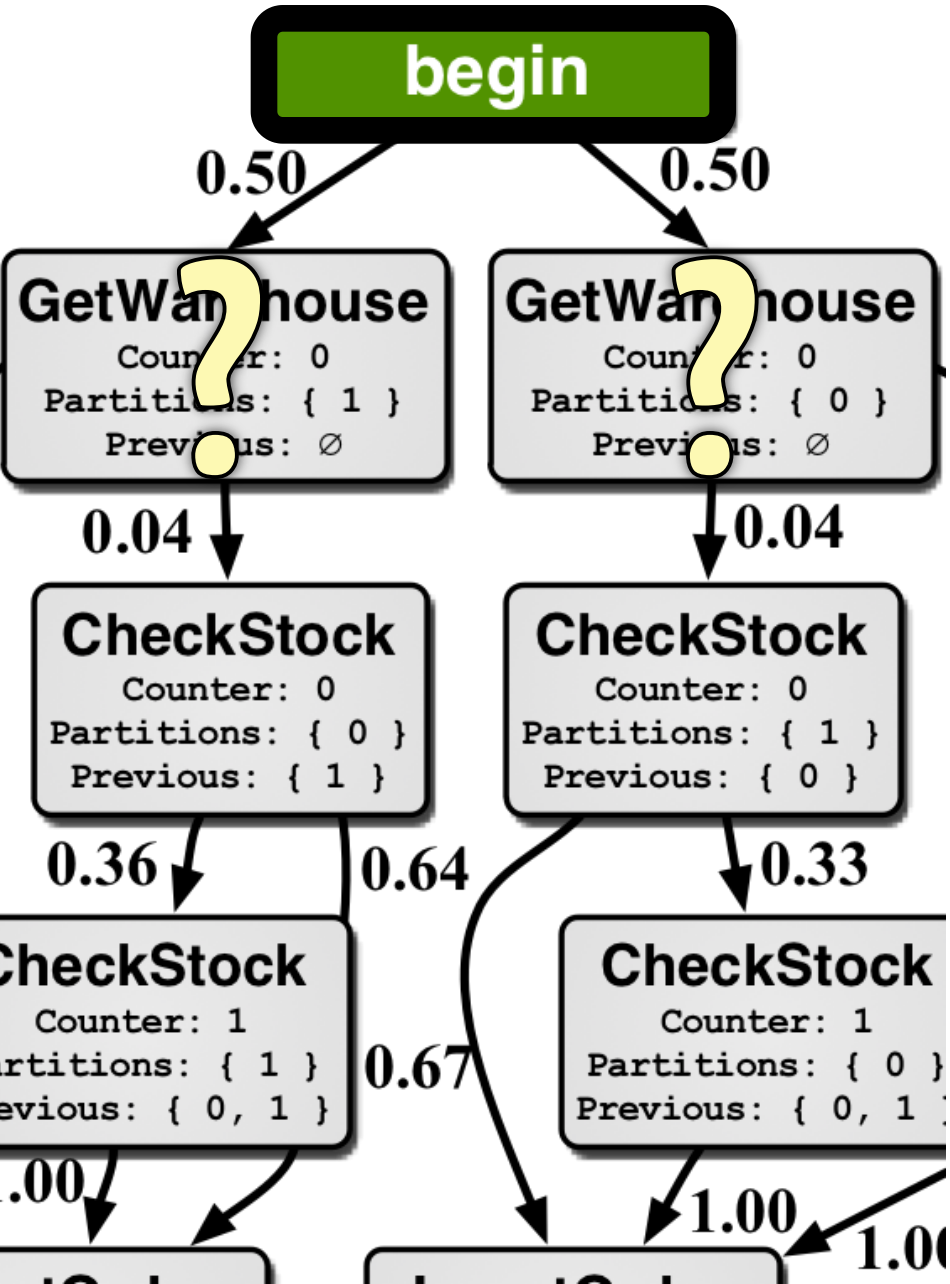
Houdini


begin
0.50
0.50
QueryName
Counter: 0
Partitions: { 1 }
Previous: ∅
QueryName
Counter: 0
Partitions: { 0 }
Previous: ∅
0.96
0.04
0.96
0.04
QueryName
Counter: 1
Partitions: { 0 }
Previous: { 0 }
0.04
1.0
abort
commit

Step #1:

Estimate the path that the transaction will take.

Current State

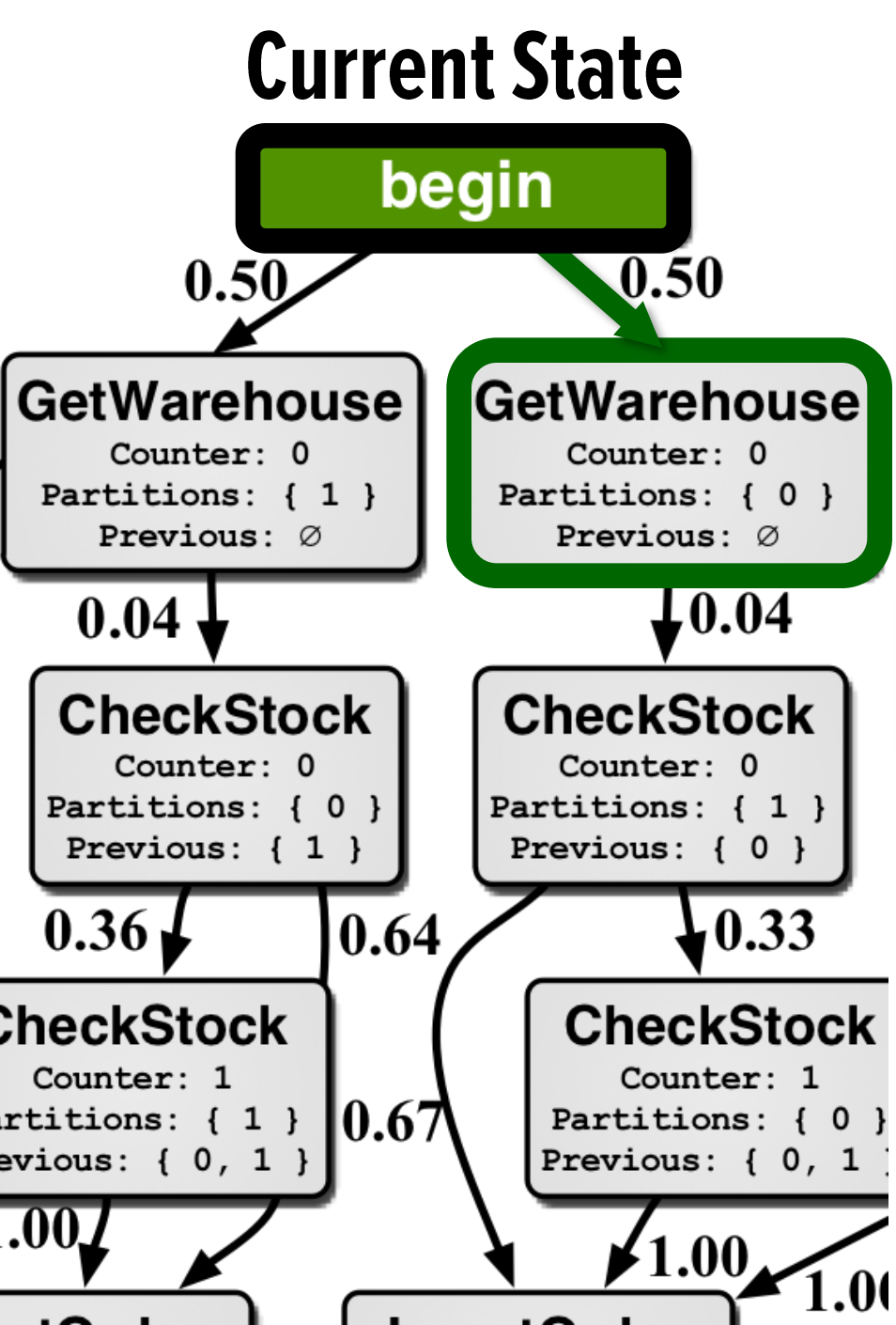


Input Parameters:

```
w_id=0
i_w_ids=[0,0]
i_ids=[1001,1002]
```

GetWarehouse:

```
SELECT * FROM WAREHOUSE
 WHERE W_ID = ?
```



Input Parameters:

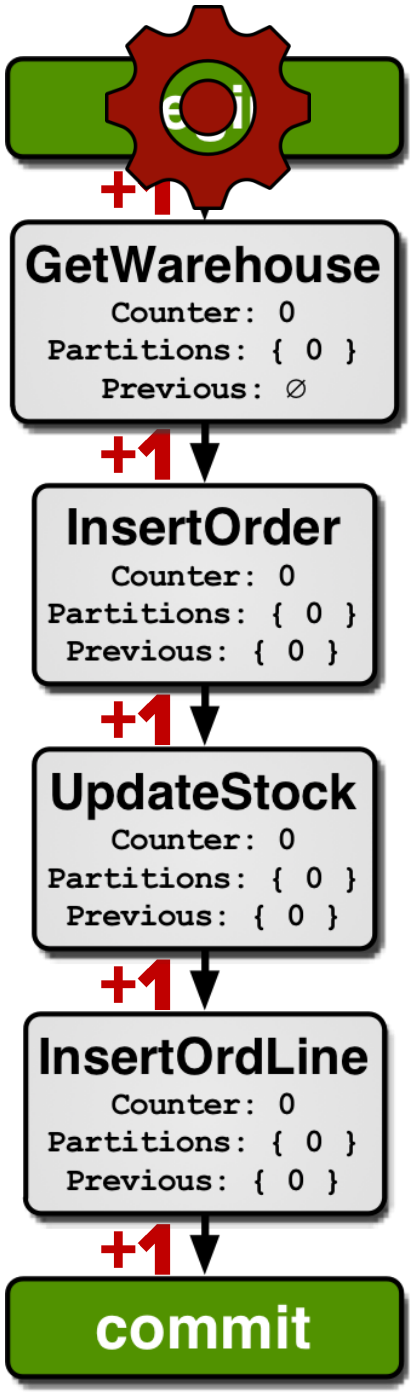
```
w_id=0
i_w_ids=[0,0]
i_ids=[1001,1002]
```

GetWarehouse:

```
SELECT * FROM WAREHOUSE
 WHERE W_ID = ?
```

Step #2:

Determine which optimizations to enable in the DBMS.

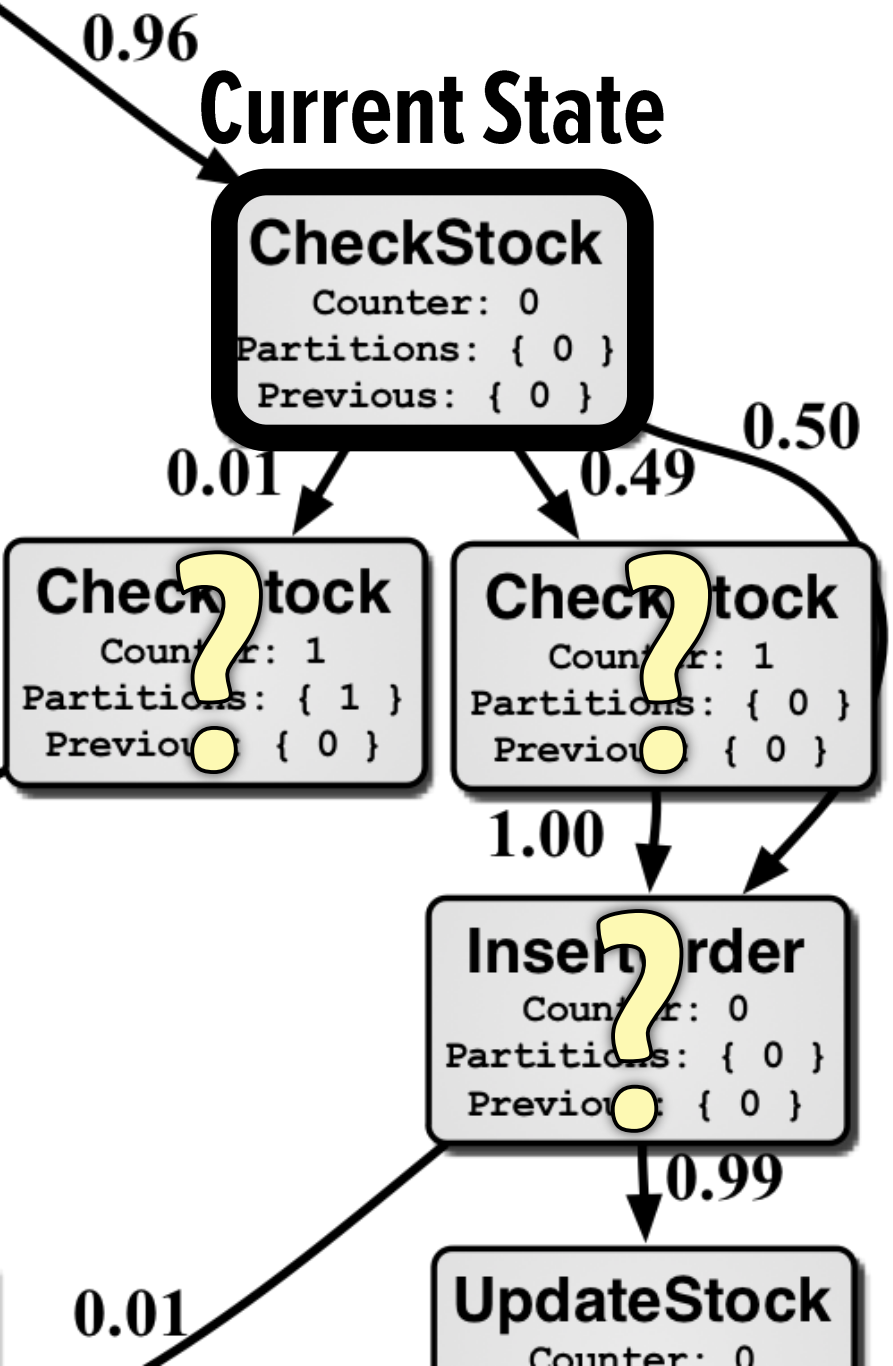


Input Parameters:

```
w_id=0
i_w_ids=[0,0]
i_ids=[1001,1002]
```

Optimizations:

- Best Partition?
- Touched Partitions?
- Finished Partitions?



Input Parameters:

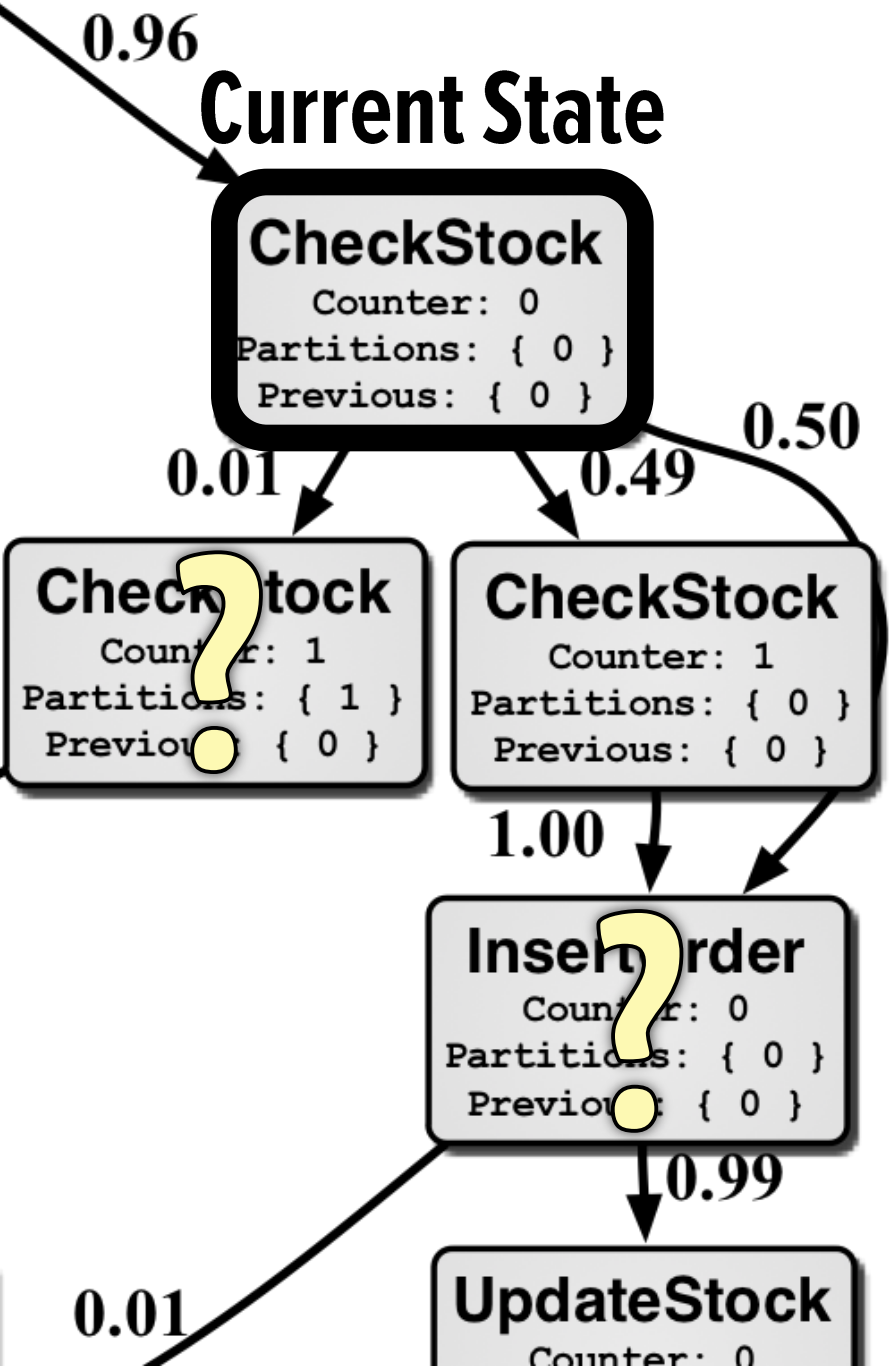
```
w_id=0
i_w_ids=[0,1]
i_ids=[1001,1002]
```

CheckStock:

```
SELECT S_QTY FROM STOCK
 WHERE S_W_ID = ?
   AND S_I_ID = ?;
```

InsertOrder:

```
INSERT INTO ORDERS
(o_id, o_w_id)
VALUES (?, ?);
```



Input Parameters:

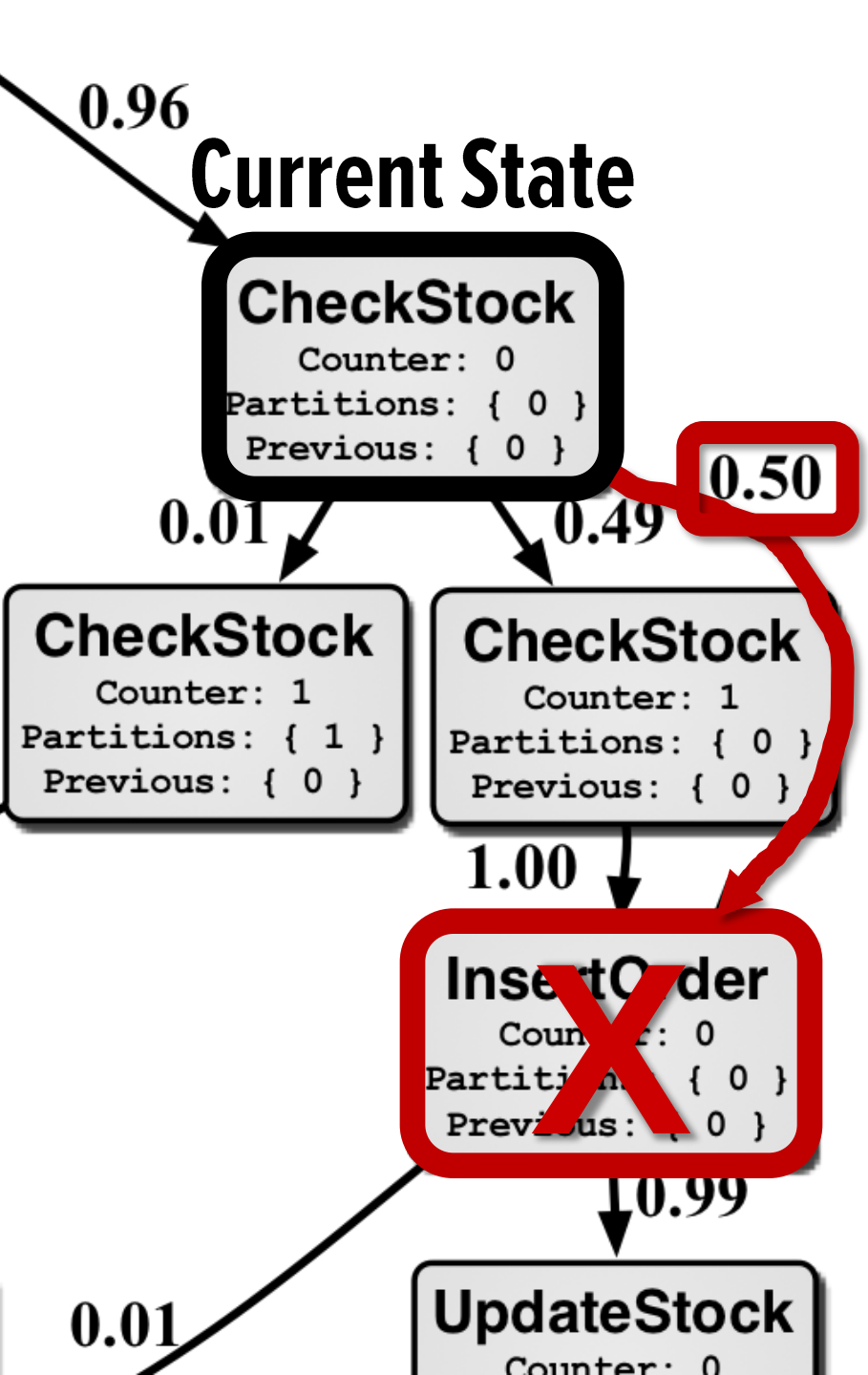
```
w_id=0
i_w_ids=[0,1]
i_ids=[1001,1002]
```

CheckStock:

```
SELECT S_QTY FROM STOCK
 WHERE S_W_ID = ?
   AND S_I_ID = ?;
```

InsertOrder:

```
INSERT INTO ORDERS
(o_id, o_w_id)
VALUES (?, ?);
```



Input Parameters:

```
w_id=0
i_w_ids=[0,1]
i_ids=[1001,1002]
```

CheckStock:

```
SELECT S_QTY FROM STOCK
 WHERE S_W_ID = ?
   AND S_I_ID = ?;
```

InsertOrder:

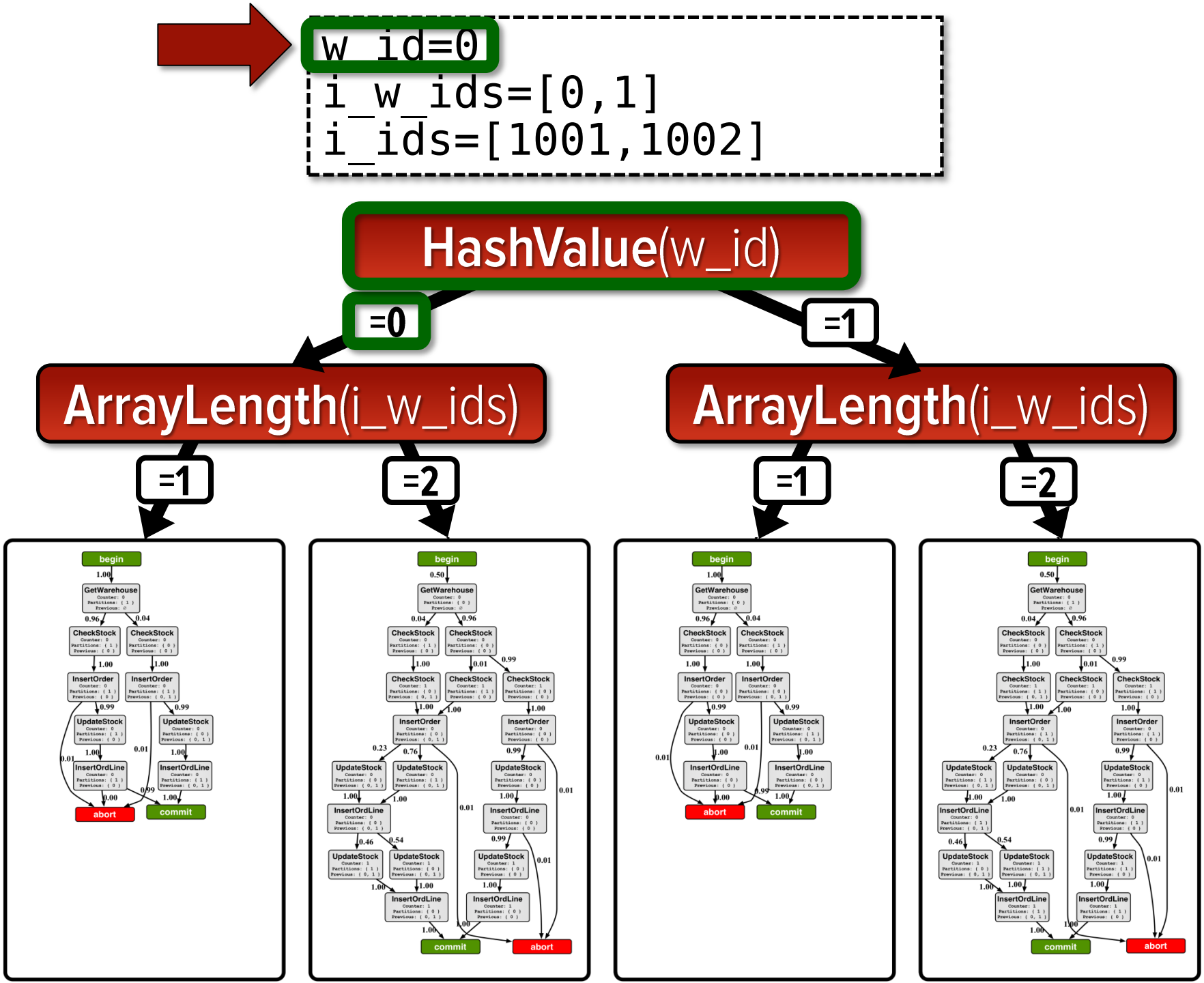
```
INSERT INTO ORDERS
(o_id, o_w_id)
VALUES (?, ?);
```

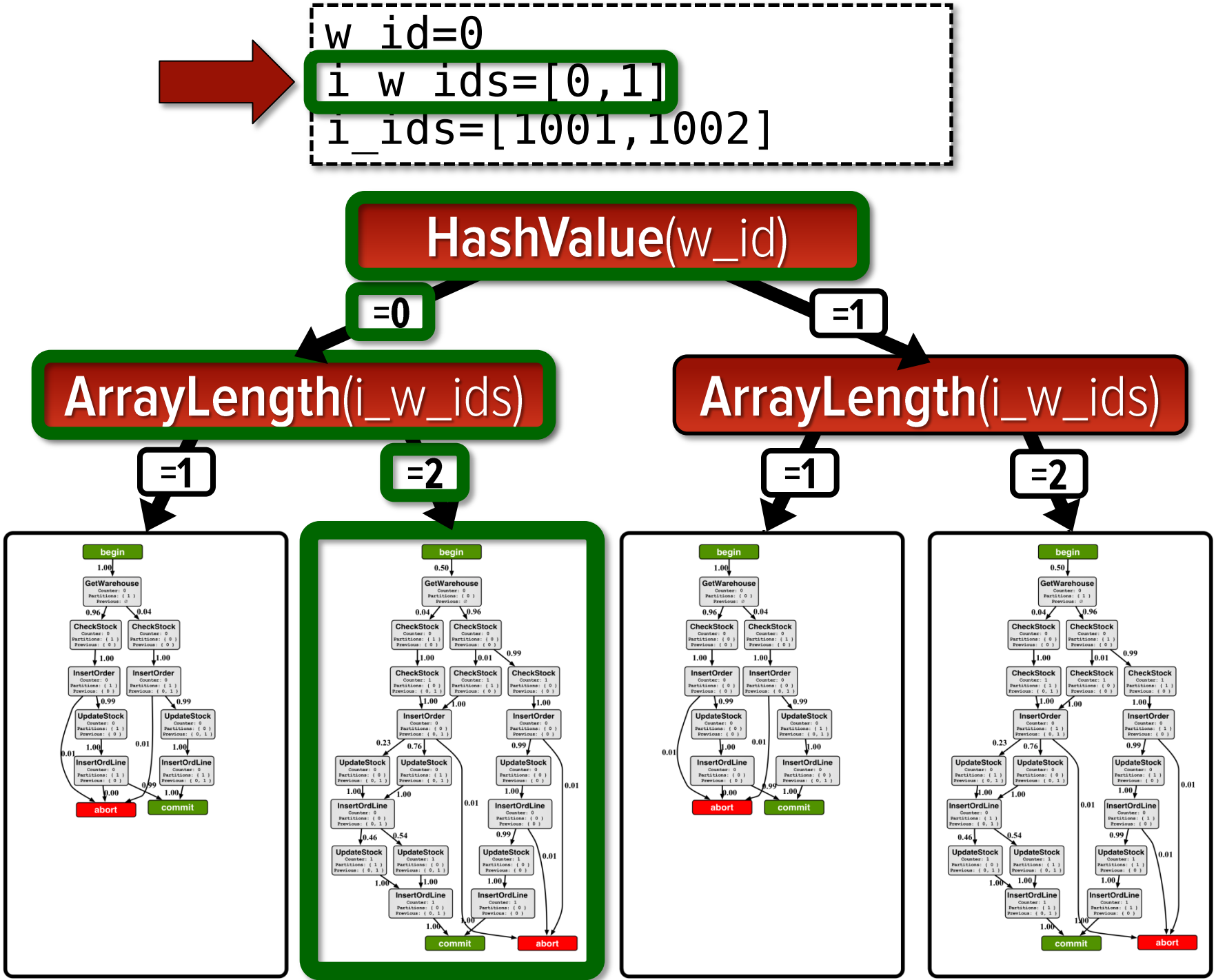
THE GIFTS OF MISS CLEO

SUNDAY,
SEPTEMBER 16
9PM ET
ON iN DEMAND
PAY-PER-VIEW

Special Guest: Evan

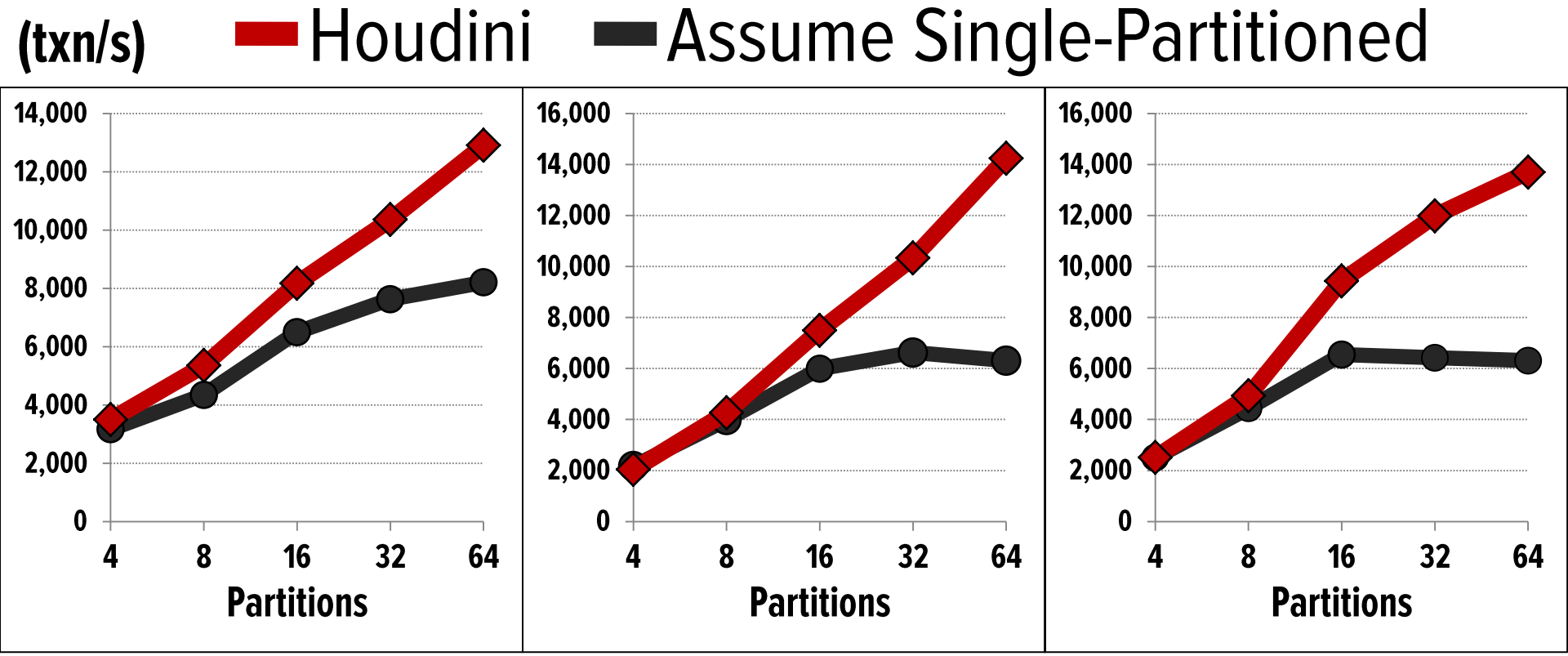
GET A FREE 7 MINUTE TAROT READING


w_id=0
i_w_ids=[0,1]
i_ids=[1001,1002]
HashValue(w_id)
=0
=1
ArrayLength(i_w_ids)
ArrayLength(i_w_ids)
=1
=2
=1
=2
begin
GetWarehouse
CheckStock
InsertOrder
UpdateStock
InsertOrdLine
abort
commit


w_id=0
i_w_ids=[0,1]
i_ids=[1001,1002]
HashValue(w_id)
=0
=1
ArrayLength(i_w_ids)
ArrayLength(i_w_ids)
=1
=2
=1
=2
begin
GetWarehouse
CheckStock
InsertOrder
UpdateStock
InsertOrdLine
abort
commit

Experimental
Evaluation

	Accuracy	Overhead
TATP	94.9%	+1.86%
TPC-C	95.0%	+1.17%
AuctionM	90.2%	+8.15%



TATP

+57%

TPC-C

+126%

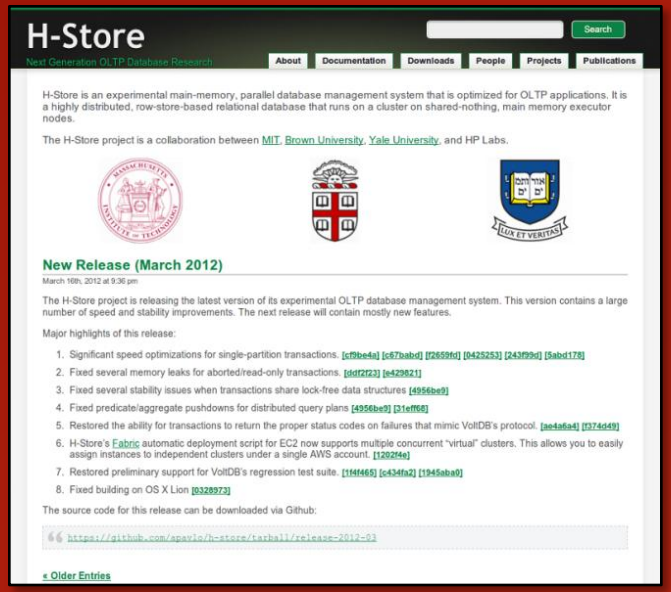
AuctionM

+117%

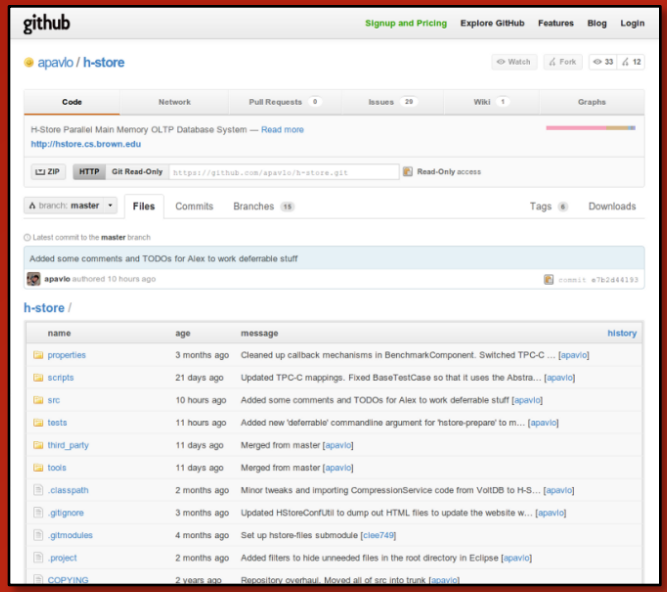
Conclusion:

Scaling your OLTP DBMS must come from within.

H-Store



http://hstore.cs.brown.edu



https://github.com/apavlo/h-store

Police arrest Canadian man charged in psychic scam

Posted by Jessica Bartlett April 17, 2012 10:24 AM

Print | Comments (1)

By Jessica Bartlett, Town Correspondent

Police have arrested **Evan P.C. Jones**, a non-French speaking Canadian man who allegedly used psychic reading sessions to scam a Pembroke woman out of thousands of dollars.

According to police, the 69-year-old victim had made several visits in early April to a "psychic and card reading" business at 49 Whiting St. in Hingham.

During those visits, the Canadian man elicited information about the victim and her family members. On the last visit, Evan told the victim that there was a "curse and a black cloud" over her, and in order to life it, she would need to pay $16,000.